

CLAIM AMENDMENTS

Please amend the claims as described below. In accordance with 37 CFR §1.121, a complete listing of all claims in the application is provided below. The status of each claim is indicated in the parenthetical expression adjacent to the corresponding claim number.

1 1. (**Currently Amended**) An analyte sensing device for sensing a concentration of
2 analyte in a fluid, the analyte sensing device comprising:

3 a housing; and

4 an analyte sensing component disposed within the housing and including:

5 a first radiation converting component ~~that is capable of converting~~ to convert
6 radiation of a first wavelength to radiation having at least one different wavelength
7 by receiving radiation of the first wavelength and, in response thereto, emitting
8 radiation having at least one wavelength that is different from the first wavelength,
9 wherein the an efficiency of conversion by the first radiation converting component
10 to radiation having at least one wavelength that is different from the first wavelength
11 is dependent on the concentration of the analyte within the housing;

12 a second radiation converting component to convert radiation of a second
13 wavelength to radiation having at least one wavelength that is different from the
14 second wavelength by receiving radiation of the second wavelength and, in
15 response thereto, emitting radiation having at least one wavelength that is different
16 from the second wavelength, wherein an efficiency of conversion of the radiation of
17 the second wavelength by the second radiation converting component is
18 independent or substantially independent of the concentration of the analyte in the
19 housing;

20 an analyte-specific binding ligand; and

21 a macroporous matrix wherein the analyte-specific binding ligand is attached
22 to the surface of, or embedded in the macroporous matrix.

1 2. **(Currently Amended)** The analyte sensing device of claim 1 wherein the
2 housing includes a ~~permeable or semi-permeable~~ membrane.

1 3. **(Previously Presented)** The analyte sensing device of claim 2 wherein the
2 membrane is comprised of a cellulose acetate material.

1 4. **(Currently Amended)** The analyte sensing device of claim 1 wherein the
2 housing includes at least a ~~permeable or semi-permeable~~ portion.

1 5. **(Currently Amended)** The analyte sensing device of claim 4 wherein the
2 ~~permeable or semi-permeable~~ portion of the housing is comprised of a cellulose acetate
3 material.

1 6. **(Previously Presented)** The analyte sensing device of claim 4 wherein the
2 housing includes a hollow dialysis fiber.

1 7. **(Previously Presented)** The analyte sensing device of claim 1 wherein the
2 analyte-specific binding ligand is a lectin.

1 8. **(Previously Presented)** The analyte sensing device of claim 1 wherein the
2 analyte sensing component further includes a radiation absorbing component ~~in close~~
3 having a proximity to the analyte-specific binding ligand that is sufficient to alter the
4 efficiency of the conversion of the radiation of the first wavelength by the first radiation
5 converting component.

1 9. **(Previously Presented)** The analyte sensing device of claim 1 wherein the
2 analyte is glucose and wherein the macroporous matrix includes agarose beads and the
3 analyte-specific binding ligand includes a lectin.

1 10. **(Previously Presented)** The analyte sensing device of claim 9 wherein the
2 lectin is Concanavalin A.

1 11. **(Previously Presented)** The analyte sensing device of claim 1 wherein the
2 analyte-specific binding ligand is covalently labeled with or ~~is in close~~ includes a proximity
3 to a radiation absorbing component that is sufficient to alter the efficiency of the conversion
4 of the radiation of a first wavelength by the first radiation converting component.

1 12. **(Currently Amended)** The analyte sensing device of claim 1 wherein the
2 analyte sensing component further comprises an analyte-analogue capable of being bound
3 by the analyte-specific ~~analyte~~ binding ligand.

1 13. **(Currently Amended)** The analyte sensing device of claim 1 wherein the
2 analyte sensing component further includes a ~~second~~ third radiation converting component
3 ~~that is capable of converting~~ to convert radiation of a ~~second~~ third wavelength to at least
4 one ~~different~~ wavelength that is different from the third wavelength, wherein the ~~an~~
5 efficiency of conversion of the radiation of the third wavelength by the third radiation
6 converting component is dependent on the concentration of the analyte ~~within~~ the housing.

1 14. **(Currently Amended)** The analyte sensing device of claim 1 wherein the first
2 and second wavelengths are the same wavelength ~~analyte sensing component further~~
3 ~~includes a second radiation converting component that is capable of converting radiation~~
4 ~~of a second wavelength to radiation having at least one different wavelength wherein the~~
5 ~~efficiency of conversion is independent or substantially independent of the concentration~~
6 ~~of the analyte within the housing.~~

1 15. **(Previously Presented)** The analyte sensing device of claim 1 wherein the
2 device is capable of being implanted within subcutaneous tissue of an animal body.

1 16. **(Previously Presented)** The analyte sensing device of claim 1 wherein the
2 analyte sensing component further comprises:
3 an analyte-analogue;
4 ~~a radiation absorbing component in close proximity to the analyte specific binding~~
5 ~~ligand~~; and

6 wherein the first radiation converting component is attached to the analyte-analogue
7 and the analyte-specific binding ligand is capable of binding to the analyte and/or analyte-
8 analogue; and

9 a radiation absorbing component having a proximity to the analyte-specific binding
10 ligand that is sufficient to alter the efficiency of the conversion of the radiation of the first
11 wavelength by the first radiation converting component when the analyte analogue is
12 bound by the analyte-specific binding ligand.

1 17. **(Previously Presented)** The analyte sensing device of claim 16 wherein the
2 housing comprises a permeable or semi-permeable membrane which allows analyte to
3 move into or out of the housing but does not allow analyte sensing component to move out
4 of the housing.

1 18. **(Currently Amended)** The analyte sensing device of claim 16 wherein the
2 efficiency of conversion of radiation at the first wavelength to radiation having the at least
3 one different wavelength by the first radiation converting component decreases is
4 ~~decreased~~ when the analyte-analogue is bound by the analyte-specific binding ligand.

1 19. **(Previously Presented)** The analyte sensing device of claim 16 wherein the
2 analyte-analogue is a dextran.

1 20. **(Previously Presented)** The analyte sensing device of claim 16 wherein the
2 analyte-analogue is a glycosylated or mannosylated protein.

1 21. **(Previously Presented)** The analyte sensing device of claim 18 wherein the
2 analyte-analogue includes a polymeric chain of glucose residues .

1 22. **(Previously Presented)** The analyte sensing device of claim 16 wherein the
2 first radiation converting component is Alexa647.

1 23. **(Previously Presented)** The analyte sensing device of claim 16 wherein the
2 analyte-specific binding ligand is a lectin.

1 24. **(Previously Presented)** The analyte sensing device of claim 23 wherein the
2 lectin is Concanavalin A.

1 25. **(Previously Presented)** The analyte sensing device of claim 23 wherein the
2 lectin is *Lens culinaris* lectin.

1 26. **(Previously Presented)** The analyte sensing device of claim 16 wherein the
2 radiation absorbing component is QSY21.

1 27. **(Previously Presented)** The analyte sensing device of claim 16 wherein the
2 radiation absorbing component is covalently bound to the analyte-specific binding ligand.

1 28. **(Previously Presented)** The analyte sensing device of claim 16 wherein the
2 radiation absorbing component is attached to the surface of or embedded throughout the
3 macroporous matrix.

1 29. **(Currently Amended)** The analyte sensing device of claim 16 further including
2 a ~~second~~ third radiation converting component ~~capable of converting~~ to convert radiation of
3 a ~~second~~ third wavelength into radiation having at least a one wavelength that is different
4 from the ~~second~~ third wavelength by receiving radiation of the third wavelength and, in
5 response thereto, emitting radiation having the at least one wavelength that is different
6 than the third wavelength.

1 30. **(Currently Amended)** The analyte sensing device of claim 1 29 wherein the
2 second radiation converting component is LD800.

1 31. **(Previously Presented)** The analyte sensing device of claim 16 wherein the
2 analyte is glucose.

Claims 32-70 **(Canceled)**.

1 71. **(Currently Amended)** An analyte sensing system for sensing a concentration
2 of analyte in a fluid, the analyte sensing system comprising:
3 an analyte sensing device including:

4 a housing; and

5 an analyte sensing component disposed within the housing and including:

6 a first radiation converting component ~~that is capable of converting to~~
7 convert radiation of a first wavelength to radiation having at least one
8 different wavelength by receiving radiation of the first wavelength and, in
9 response thereto, emitting radiation having at least one wavelength that is
10 different from the first wavelength, wherein ~~the~~ an efficiency of conversion by
11 the first radiation converting component to radiation having at least one
12 wavelength that is different from the first wavelength is dependent on the
13 concentration of the analyte within the housing;

14 a second radiation converting component to convert radiation of a
15 second wavelength to radiation having at least one wavelength that is
16 different from the second wavelength by receiving radiation of the second
17 wavelength and, in response thereto, emitting radiation having at least one
18 wavelength that is different from the second wavelength, wherein an
19 efficiency of conversion of the radiation of the second wavelength by the
20 second radiation converting component is independent or substantially
21 independent of the concentration of the analyte in the housing;

22 an analyte-specific binding ligand; and

23 a macroporous matrix wherein the analyte-specific binding ligand is
24 attached to the surface of, or embedded in the macroporous matrix;

25 a radiation providing unit to provide radiation at the first wavelength; and

26 a radiation detecting unit to detect the radiation ~~of~~ having one or more wavelengths
27 ~~at least one different wavelength and to~~ output data which is representative of the intensity

28 of the radiation of ~~the at least one different wavelength~~ emitted by the first and second
29 radiation converting components.

1 72. **(Currently Amended)** The analyte sensing system of claim 71 further including
2 an analysis unit, ~~coupled to the radiation detecting unit,~~ to determine the concentration of
3 analyte ~~within the housing~~ using the data which is representative of the intensity of the
4 radiation of ~~the at least one different wavelength~~ emitted by the first and second radiation
5 converting components.

1 73. **(Previously Presented)** The analyte sensing system of claim 71 wherein the
2 radiation detecting unit includes a plurality of radiation detecting devices wherein each
3 device is capable of detecting a wavelength-specific portion of radiation.

1 74. **(Currently Amended)** The analyte sensing system of claim 71 wherein:
2 the first radiation converting component ~~is capable of converting~~ converts radiation
3 of the first wavelength to radiation having a plurality of wavelengths by receiving radiation
4 of the first wavelength and, in response thereto, emitting radiation having the plurality of
5 wavelengths, wherein ~~the~~ an efficiency of conversion to the radiation having the plurality of
6 wavelengths is dependent on the concentration of the analyte ~~within the housing;~~ and
7 the radiation detecting unit includes a plurality of radiation detecting devices ~~wherein~~
8 ~~each device is capable of~~ to detecting at least one of the plurality of wavelengths.

1 75. **(Currently Amended)** The analyte sensing system of claim 71 wherein:

2 the first radiation converting component ~~is capable of converting~~ converts radiation
3 of the first wavelength to radiation having a plurality of wavelengths within a first
4 wavelength range by receiving radiation of the first wavelength and, in response thereto,
5 emitting radiation having the plurality of wavelengths within the first wavelength range,
6 wherein the an efficiency of conversion to the radiation having the plurality of wavelengths
7 within the first wavelength range is dependent on the concentration of the analyte inside
8 within the housing; and

9 the radiation detecting unit includes a plurality of radiation detecting devices wherein
10 ~~each device is capable of~~ to detecting radiation within the first wavelength range.

1 76. **(Previously Presented)** The analyte sensing system of claim 75 wherein the
2 radiation detecting unit includes one or more photodiode detectors or a CCD array.

1 77. **(Previously Presented)** The analyte sensing system of claim 71 wherein the
2 radiation providing unit is disposed within or adjacent to the housing.

1 78. **(Currently Amended)** The analyte sensing system of claim 71 wherein:
2 the analyte sensing component further includes a ~~second~~ third radiation converting
3 component ~~that is capable of converting~~ to convert radiation of a ~~second~~ third wavelength
4 to at least one different wavelength by receiving the radiation of a third wavelength and, in
5 response thereto, emitting radiation having at least one wavelength that is different from
6 the third wavelength, wherein the an efficiency of conversion is dependent on the
7 concentration of the analyte in the housing;

8 the radiation detecting unit outputs data which is representative of the an intensity of
9 the radiation ~~of the at least one different wavelength emitted by~~ of the first, and second and
10 third radiation converting components; and

11 wherein the analyte sensing system further includes an analysis unit, coupled to the
12 radiation detecting unit, to determine the concentration of analyte in the housing using the
13 data output by the radiation detecting unit.

1 79. **(Currently Amended)** The analyte sensing system of claim 71 wherein:

2 ~~the analyte sensing component further includes a second radiation converting~~
3 ~~component that is capable of converting radiation of a second wavelength to at least one~~
4 ~~different wavelength wherein the efficiency of conversion is independent or substantially~~
5 ~~independent of the concentration of the analyte in the housing;~~

6 ~~the radiation detecting unit outputs data which is representative of the intensity of~~
7 ~~the radiation of the at least one different wavelength of the first and second radiation~~
8 ~~converting components; and~~

9 ~~wherein~~ the analyte sensing system further includes an analysis unit, coupled to the
10 radiation detecting unit, to determine the concentration of analyte inside the housing using
11 the data output by the radiation detecting unit.

1 80. **(Currently Amended)** The analyte sensing system of claim 79 wherein the
2 determination of the concentration of the analyte by the analysis unit includes (1)
3 conditioning the data output by the radiation detecting unit and (2) computing the ratio of
4 the intensity of the radiation in a first wavelength range corresponding to radiation emitted

5 by the first radiation converting component and a second wavelength range corresponding
6 to radiation emitted by the second radiation converting component ~~uses a difference in the~~
7 ~~intensities of radiation detected by the radiation detecting unit due to the at least one~~
8 ~~different wavelength of the first radiation converting component relative to the at least one~~
9 ~~different wavelength of the second radiation converting component.~~

Claims 81-101 (Canceled).

1 102. (Currently Amended) An analyte sensing device for sensing a concentration
2 of analyte in a fluid, the analyte sensing device comprising:
3 a housing;
4 an analyte-analogue disposed within the housing;
5 a macroporous matrix disposed within the housing;
6 an analyte-specific binding ligand, (i) attached to the surface of the macroporous
7 matrix or (ii) disposed or embedded in the macroporous matrix, and capable of binding to
8 analyte and/or analyte-analogue;
9 a first radiation converting component, attached to the analyte-analogue, and
10 ~~capable of converting~~ to convert radiation of a first wavelength to radiation having at least
11 one different wavelength by receiving radiation of the first wavelength and, in response
12 thereto, emitting radiation having at least one wavelength that is different from the first
13 wavelength, wherein the an efficiency of conversion by first radiation converting component
14 to radiation having at least one wavelength that is different from the first wavelength is
15 dependent on the concentration of analyte within the housing;

16 a second radiation converting component to convert radiation of a second
17 wavelength to radiation having at least one wavelength that is different from the second
18 wavelength by receiving radiation of the second wavelength and, in response thereto,
19 emitting radiation having at least one wavelength that is different from the second
20 wavelength, wherein an efficiency of conversion of the radiation of the second wavelength
21 by the second radiation converting component is independent or substantially independent
22 of the concentration of the analyte in the housing; and
23 a radiation absorbing component, disposed within the housing, ~~and in close~~ having a
24 proximity to the analyte-specific binding ligand that is sufficient to alter the efficiency of the
25 conversion of the radiation of the first wavelength by the first radiation converting
26 component.

1 103. **(Previously Presented)** The analyte sensing device of claim 102 wherein the
2 housing comprises a permeable or semi-permeable membrane which allows analyte to
3 move into or out of the housing but does not allow analyte sensing component to move out
4 of the housing.

1 104. **(Currently Amended)** The analyte sensing device of claim 102 wherein the
2 efficiency of conversion of radiation at the first wavelength to radiation having the at least
3 one different wavelength by the first radiation converting component ~~is decreased~~
4 decreases when the analyte-analogue is bound by the analyte-specific binding ligand.

1 105. **(Previously Presented)** The analyte sensing device of claim 104 wherein the
2 analyte-analogue includes a polymeric chain of glucose residues.

1 106. **(Previously Presented)** The analyte sensing device of claim 102 wherein the
2 analyte-analogue is a dextran.

1 107. **(Previously Presented)** The analyte sensing device of claim 102 wherein the
2 analyte-analogue is a glycosylated or mannosylated protein.

1 108. **(Previously Presented)** The analyte sensing device of claim 102 wherein the
2 first radiation converting component is Alexa647.

1 109. **(Previously Presented)** The analyte sensing device of claim 102 wherein the
2 analyte-specific binding ligand is a lectin.

1 110. **(Previously Presented)** The analyte sensing device of claim 109 wherein the
2 lectin is Concanavalin A.

1 111. **(Previously Presented)** The analyte sensing device of claim 109 wherein the
2 lectin is *Lens culinaris* lectin.

1 112. **(Previously Presented)** The analyte sensing device of claim 102 wherein the
2 radiation absorbing component is QSY21.

1 113. **(Previously Presented)** The analyte sensing device of claim 102 wherein the
2 radiation absorbing component is covalently bound to the analyte-specific binding ligand.

1 114. **(Previously Presented)** The analyte sensing device of claim 102 wherein the
2 radiation absorbing component is attached to the surface of or embedded throughout the
3 macroporous matrix.

1 115. **(Currently Amended)** The analyte sensing device of claim 102 further
2 including a ~~second~~ third radiation converting component ~~capable of converting~~ to convert
3 radiation of a ~~second~~ third wavelength into radiation having at least a one wavelength that
4 is different from the ~~second~~ third wavelength by receiving radiation of the third wavelength
5 and, in response thereto, emitting radiation having at least one wavelength that is different
6 from the third wavelength.

1 116. **(Currently Amended)** The analyte sensing device of claim 102 ~~115~~ wherein
2 the second radiation converting component is LD800.

1 117. **(Previously Presented)** The analyte sensing device of claim 102 wherein the
2 analyte is glucose.

1 118. **(New)** The analyte sensing device of claim 102 wherein the second radiation
2 converting component is a TransFluoSpheres.

1 119. **(New)** The analyte sensing device of claim 102 wherein the first and second
2 wavelengths are the same wavelength.

1 120. **(New)** The analyte sensing device of claim 1 wherein the second radiation
2 converting component is a TransFluoSpheres.

1 121. **(New)** The analyte sensing system of claim 71 wherein the second radiation
2 converting component is LD800.

1 122. **(New)** The analyte sensing system of claim 71 wherein the second radiation
2 converting component is a TransFluoSpheres.

1 123. **(New)** The analyte sensing system of claim 71 wherein the first and second
2 wavelengths are the same wavelength.